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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Daryl Chapman

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MILLER IP GROUP, PLC
GENERAL MOTORS CORPORATION
42690 WOODWARD AVENUE
SUITE 200
BLOOMFIELD HILLS, MI 48304

EXAMINER

LEWIS, BEN

ART UNIT

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1795

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/811,204	Applicant(s) CHAPMAN ET AL.	
	Examiner Ben Lewis	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,5,10 and 31 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1,5,10 and 31 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>4/2/08</u> . | 6) <input type="checkbox"/> Other: ____. |

Detailed Action

1. The Applicant's amendment filed on April 30th, 2008 was received. Claim 1 was amended. Claims 2-4, 6-9 and 11-30 were cancelled. Claim 31 was added.
2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action (issued on January 31st, 2008).

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 1 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Paragraphs [0019] and [0020] of Applicant's specification states:

According to the invention, the system 10 employs a technique for safely bleeding the anode exhaust gas from the fuel cell stack 12 without the need for employing a combustor. The system 10 includes an accumulator 26, such as a suitable tank, that accumulates the purged anode exhaust gas so that it can be safely bled to the

environment or otherwise at relatively low non-combustible hydrogen concentrations. A purge valve 28 is coupled to the exhaust line 22. The valve 28 is selectively opened to allow the anode exhaust gas to be accumulated by the accumulator 26 (Paragraph 0019).

In one embodiment, the valve 28 is a spring-biased solenoid control valve, where the spring bias default position causes the valve 28 to be closed. By applying a potential to the solenoid of the valve 28, it slides against the bias of the spring so that the valve 28 is opened and the anode exhaust gas can flow into the accumulator 26. Therefore, the combustible anode exhaust gas is not released from the system 10 when it is purged from the fuel cell stack 12, but is safely contained within the accumulator 26 (Paragraph 0020).

Since there is no teaching of “where the rate that the anode exhaust gas is bled from the accumulator is less than the rate that the anode exhaust gas is purged into the accumulator through the purge valve” then there appears to be no support for the newly added claim 19. (Examiner notes that there is no teaching of the relative purge rates of the bleed valve and the purge valve in Applicants specification);

4. The claim rejections under 35 U.S.C. 112, second paragraph, on claim 3 is withdrawn, because the claims have been cancelled.

Claim Rejections - 35 USC § 103

5. Claims 1 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamada et al. (JP 11-191422) in view of James et al. (U.S. Patent No. 6,406,805 B1).

With respect to claim 1, Hamada et al. disclose a fuel cell system (title) which comprise a fuel cell stack (10) with cathode input gas supply fan (70) and hydrogen anode input gas supply line (46). (See Figs. 1 and 2).

With respect to an accumulator, Hamada et al. disclose a hydrogen/water separator (54) (accumulator) connected to the hydrogen exhaust line (Paragraphs 0019-0021).

With respect to a bleed valve for selectively bleeding the anode exhaust gas accumulated in the accumulator, Hamada et al. teach that valve (80) (bleed valve) is connected to the hydrogen/water separator (accumulator) (Paragraph 0022-0023).

With respect to combining the bleed anode exhaust gas from the bleed valve with cathode exhaust gas, Hamada et al. teach that unreacted gas from the anode flows to mixer (78) and cathode air side is also connected to mixer (78) by air exhaust pipe (86) (Paragraphs 0022-0024).

Hamada et al. do not specifically teach a purge valve coupled to the anode exhaust line. However, James et al. disclose a fuel cell system wherein a fuel cell

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controller 24 controls the operation of the fuel cell 10. When the controller 24 determines that the fuel cell 10 requires purging, the controller 24 signals a three-way valve 26 (purge valve) to move from a closed position to a first position. When the valve 26 is in the first position, the purged hydrogen, other gases, and water are directed to a water removal device 28 (accumulator) (Col 3 lines 64-67; Col 4 lines 1-25). Therefore it would have been obvious to one of ordinary skill in the art to incorporate the purge valve of James et al. into the fuel cell system of Hamada et al. in order to control purging of hydrogen exiting the fuel cell and prevent build up of hydrogen in the fuel cell (Col 4 lines 45-67). (Examiner notes that when valve (80) of Hamada et al. is opened it forms a fixed orifice.)

With respect to claim 5, Hamada et al. teach that unreacted gas from the anode flows to mixer (78) and cathode air side is also connected to mixer (78) by air exhaust pipe (86) (Paragraphs 0022-0024). Hamada et al. teach that the mixed anode and cathode exhaust is discharged from an exhaust duct (Paragraph 0024) (See Figs 1 and 2).

With respect to claim 31, Hamada et al. teach that under heavy loads gas is purged from valve 82 (second orifice) in addition to valve 80 (Paragraph 0033- 0034).

7. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hamada et al. (JP 11-191422) in view of James et al. (U.S. Patent No. 6,406,805 B1) and further in view of Kumar (U.S. Patent No. 5,785,298).

With respect to claim 10, Hamada et al. as modified by James et al. disclose a fuel cell system (title) which comprise a fuel cell stack (10) with cathode input gas supply fan (70) and hydrogen anode input gas supply line (46). (See Figs. 1 and 2). Hamada et al. as modified by James et al. teach that valve (80) (bleed valve) is connected to the hydrogen/water separator (accumulator) (Paragraph 0022-0023). Hamada et al. as modified by James et al. do not disclose wherein the purge valve is a spring-based solenoid valve. However, Kumar discloses a proportional solenoid-controlled fluid valve assembly (title) wherein, solenoid valves disclosed by Kumar are used in precision fluid flow regulation systems, for example of the type that require precise regulation of the rate of flow of a fluid, such as pneumatic or hydraulic regulation, and is particularly directed to the configuration of a new and improved solenoid-driven valve control structure, through which the output force and axial displacement imparted by the solenoid to a spring-biased valve control mechanism, and thereby fluid flow through an associated fluid flow-regulating valve assembly, may be controlled so as to be proportional to the application of an electrical current to the solenoid (Col 1 lines 1-17). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute a spring-based solenoid controlled valve of Kumar for the purge valve of Hamada et al. as modified by James et al. because Kumar teach that fluid flow through an associated fluid flow-regulating valve

assembly, may be controlled so as to be proportional to the application of an electrical current to the solenoid (Col 1 lines 1-17).

Response to Arguments

8. Applicant's arguments filed on April 30th, 2008 have been fully considered but they are not persuasive.

Applicant's principal arguments are

(a) Independent claim 1 has been amended above to state that the bleed valve is at least one fixed orifice that continually bleeds the anode exhaust gas from the accumulator at a slower rate than the purge valve purges the anode exhaust gas into the accumulator. Support for this can be found in the specification in at least paragraph [0019] where it states that the contents of the accumulator 26 can be slowly removed through the bleed valve 30 before the next purge cycle, and paragraph [0020] where it states that the bleed valve 30 can be a fixed orifice where the amount of the anode exhaust gas bled through the orifice is continuous.

Applicant respectfully submits that the prior art of record does not teach or suggest that the bleed valve can be a fixed orifice that bleeds anode exhaust gas from an accumulator.

(b) Applicant respectfully submits that James et al. only discloses that the vent valve 34 is a controllable valve that is selectively opened and closed based on a signal from the controller 24. Therefore, it is clear that James et al. does not teach or suggest that the vent valve 34 can be a fixed orifice that continuously allows gas in the container 30 to be vented. Likewise, the needle valves 80 and 82 in Akira et al. are electromagnetically controlled valves for selectively controlling the flow of the gas from the tank 54 to the mixer 78, and are not fixed orifices that continually allow a gas flow from the tank 54 to the mixer 78.

In response to Applicant's arguments, please consider the following comments.

(a) and (b) With respect to "the bleed valve is at least one fixed orifice that continually bleeds the anode exhaust gas from the accumulator at a slower rate than the purge valve purges the anode exhaust gas into the accumulator", a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). Since the bleed valve (80) of Hamada et al. is capable of being opened and closed. Then it is capable of performing the functions as claimed by Applicant. (Examiner notes that when valve (80) of Hamada et al. is opened it forms a fixed orifice) .

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ben Lewis whose telephone number is 571-272-6481. The examiner can normally be reached on 8:30am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ben Lewis/
Examiner, Art Unit 1795

/PATRICK RYAN/
Supervisory Patent Examiner, Art Unit 1795